UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

NOKIA SOLUTIONS AND NETWORKS US LLC and NOKIA SOLUTIONS AND NETWORKS OY,
 	
    Plaintiffs and
    Counterclaim Defendants,
 	
v.
 	
HUAWEI TECHNOLOGIES CO. LTD. and HUAWEI DEVICE USA, INC.,
 	
    Defendants and
    Counterclaim Plaintiffs.
	Civil Action No. 2:16-cv-00756-JRG-RSP
	
	JURY TRIAL DEMANDED

NOKIA SOLUTIONS AND NETWORKS US LLC AND
NOKIA SOLUTIONS AND NETWORKS OY'S
<u>OPENING CLAIM CONSTRUCTION BRIEF</u>

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INTRODUCTION

Nokia Solutions and Networks US LLC and Nokia Solutions and Networks Oy ("NSN") are world leaders in standardized-communication protocols, such as LTE. NSN was a major contributor to the development of LTE, and the inventions described in the patents asserted here are essential to the standards that Huawei Technologies Co. Ltd. and Huawei Device USA, Inc. ("Huawei") must practice to provide their smart devices.

Specifically, U.S. Patent Nos. 8,121,082 (the "082 Patent") and 8,165,035 (the "035 Patent") (Exhibits A and B, respectively) are essential to standards used by the telecommunications industry and, as standard-essential patents, claim concepts using terms well understood by, and commonly used in, the industry. Some terms, however, would benefit from constructions in order to lend clarity to the scope of the inventions. NSN's proposed constructions provide this clarity, whereas Huawei's proposed constructions seek to import additional limitations into the claims. Accordingly, NSN respectfully requests that the Court adopt its proposed constructions.

TECHNOLOGY OVERVIEW

I.   CELLULAR TELECOMMUNICATIONS

At the most basic level, cellular networks consist of cell phones, tablets, or computers communicating wirelessly with network equipment. Many different names have been used over the years to describe similar types of network elements, but some basic principles remain the same. Mobile devices are sometimes called terminals, cell phones, mobiles, or user equipment ("UEs"). The radio communications equipment in a cell tower has been referred to as a base station, node b, evolved NodeB, or eNodeB ("eNB"). Between the UE and the Internet or the Public Switched Telephone Network lies the network equipment that makes up the cellular "network infrastructure." The network infrastructure is a complex combination of computers, software, and

specialized equipment that is deployed and managed by various cellular network providers. The

patents-in-suit primarily relate to transmissions between the UE and the eNB.

In the second half of the 2000's, industry groups began developing a "Long Term

Evolution" solution (LTE) to provide a fourth generation of mobile services. LTE networks have

both increased speed and capacity for data transfer when compared to previous generations. Many

aspects of the operation of LTE are mandated by agreed-upon documents called standards that are

created and adopted by the 3rd Generation Partnership Project ("3GPP"). The 3GPP LTE

standards promote interoperability and allow components from different manufacturers to work

together. Many different manufacturers, such as Huawei, Apple, and Samsung, make or sell UEs

like cell phones and tablets. There are also many different network providers, such as T-Mobile,

Sprint, Verizon, and AT&T. The 3GPP LTE standards allow UEs made by different companies

to work with varying cellular networks by defining, among other things, the interfaces between

the UE and the eNB.

II.   NSN'S STANDARD-ESSENTIAL PATENTS

Smart devices using LTE and LTE-Advanced networks receive and transmit much greater

amounts of data than previous standardized-communication protocols.   Additionally, the

proliferation of smart devices has resulted in densely populated and high traffic networks. In such

networks, smart devices within proximity of one another suffer from signal interference and

potential data loss. This complicates the ability for a smart device to transmit and receive data,

ultimately degrading the efficiency and performance of networked devices.

Critical to achieving LTE's fast data rates is the communication between the UE and eNB

of control signals that are sent to prevent errors and make data transmission more efficient. Each

of these signals is a small, "low-rate" signal that is sent often. For example, a UE will transmit

signals to verify that information transmitted by one entity has been received by another. A UE

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will transmit an acknowledgement ("ACK") for data received correctly or a negative acknowledgement ("NACK") for data received incorrectly. In situations where the data is not received at all, the UE does not a send an ACK or NACK. The lack of ACK/NACK on the ACK/NACK resource would indicate that the data was not received. This is called discontinuous transmission ("DTX"). If the eNB does not receive an ACK/NACK on the ACK/NACK resource, the eNB will know that a DTX has occurred and the eNB may resend the data. DTX detection is critical to preventing errors and to making the system more efficient. Transmission of the ACK and NACK messages and accurate DTX detection are critical to the efficiency and performance of networked devices.

A.   The 082 Patent

At the time of the invention of the 082 patent, 3GPP members had agreed that "simultaneous transmission of SR [scheduling request] and ACK/NACK is to be supported" (Exh. A (082 Patent) at 2:55-56). A scheduling request is sent from the UE to the eNB to ask the eNB to allocate resources so that the UE will know how to send its data. The simultaneous transmission of SR and ACK/NACK is important because it allows the UE to send two critical signals at the same time on one frequency band. "However, the specifics of the multiplexing method [for combined SR and ACK/NACK] and the exact transport format have been reserved for future study" (Exh. A (082 Patent) at 2:55-59). One option considered prior to NSN's invention was for "the ACK/NACK to be sent from the SR resource if SR and ACK/NACK need to be transmitted simultaneously" (Exh. A (082 Patent) at 2:59-62). But this option created a problem with DTX detection where ACK/NACK is sent on the SR resource.

The eNB may not be able to detect that the downlink resource allocation grant has failed, because the eNB can no longer detect DTX by the lack of an ACK/NACK on the SR resource because that resource does not typically contain that information. Further, when the ACK/NACK

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is transmitted on the SR resource, the eNB may misinterpret the message it receives as an ACK, where in reality there was a DTX. This error is especially troublesome because the eNB then continues to transmit data when the UE is not receiving the data, wasting system resources. The 082 patent solves this problem by disclosing constellation arrangements where there is maximum separation between SR plus DTX and SR plus ACK. A constellation arrangement is a mapping of information that needs to be sent (*e.g.*, SR, ACK, and NACK) with symbols that represent that information. But sometimes, the symbols can be misinterpreted for another symbol where the two symbols are close together.

B.   The 035 Patent

The 035 Patent is directed to apparatuses and methods for providing DTX detection in situations where it is insufficient to signal DTX by transmitting nothing (*i.e.*, not transmitting an ACK or NACK) (Exh. B (035 Patent) at 5:55-62, 6:24-31). In certain situations, it would be difficult to "switch off power" to signal DTX since it would cause errors (Exh. B (035 Patent) at 5:62-64, 8:34-40). One example of when transmitting something for DTX is needed is where there are multiple downlink allocation grants because the eNB will receive an ACK/NACK from the UE in response to at least one downlink allocation grant (s*ee*, *e.g.*, Exh. B (035 Patent) at 10:22-35). In other words, the eNB will not be able to detect DTX because it will have received an ACK/NACK. To solve this problem, the 035 Patent discloses ways to support DTX detection in these situations such that the UE does not need to be switched off and DTX is signaled without high signaling overhead (Exh. B (035 Patent) at 5:65-67). For example, the patent discloses sending an indication of discontinuous transmission.

ARGUMENT

I.   TERMS AND PROPOSED CONSTRUCTIONS OF THE 082 PATENT

A.   The specification discloses corresponding structure and an algorithm for the "message generation means" of Claim 10

Claim Term	NSN's Proposed Construction	Huawei's Proposed Construction
"message generation means for generating a message comprising a scheduling request," "message generation means is further for: configuring the message in a first configuration in response to a determination that the acknowledgement is not to be included, and configuring the message in a second configuration comprising the acknowledgement in response to a determination that the acknowledgement is to be included, where the first configuration is distinct from the second configuration," "the message generation means is further for configuring the message in a third configuration comprising the negative-acknowledgement in response to a determination that the negative-acknowledgement is to be included" Claim 10	Governed by 35 U.S.C. § 112 ¶ 6. Function: Agreed to. Structure: message generation means (10F) such as processor, memory, and/or associated software for mapping the constellation points shown in Figs. 3, 4, 5, 6, or 12, or the constellation points described in the corresponding text, *e.g.*, 7:39- 8:59, 9:52-61, and equivalents thereof	Governed by 35 U.S.C. § 112 ¶ 6. Function: Agreed to. Structure: The specification fails to set forth any algorithm for the function claimed in this software limitation. Claim is indefinite.

The specification of the 082 Patent discloses structure, including an algorithm, corresponding to the "message generation means" of claim 10. The "message generation means" is for configuring and generating a message in a specific configuration in response to whether an SR, SR and ACK, or SR and NACK is to be sent.[1] To configure the message in one of these three

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[1] The parties agree that the function of the "message generation means" is for (i) generating a message comprising a scheduling request and configuring the message in a first configuration in response to a determination that the acknowledgement is not to be included, and (ii) configuring the message in a second configuration comprising the acknowledgement in response to a determination that the acknowledgement is to be included, where the first configuration is distinct from the second configuration and (iii) configuring the message in a third configuration comprising the negative-acknowledgement in response to a determination that the negative-acknowledgement

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configurations, the specification provides a mapping of constellation points (as shown in Figs. 3, 4, 5, 6, or 12). For example, Figure 3 discloses that the message be configured in a specific constellation point for (i) SR, (ii) SR and ACK, and (iii) SR and NACK.

The specification further explains exactly how these constellation points are used. In order to generate and configure a message with SR, the specification states that "the UE transmits the ACK/NACK information using a SR resource with the modulation constellation shown in either Figure 3 or 5 for mapping a 1-bit ACK/NACK indication, or the modulation shown in either Figure 4 or Figure 6 or Figure 12 for mapping a 2-bit ACK/NACK indication" (Exh. A (082 Patent) at Figure 8, Block 8B). Thus, Figure 8 and the constellation mappings shown in Figures 3-6 along with the corresponding text provide the algorithm for generating and configuring the message.

For example, Figure 3 shows a "constellation mapping of 1-bit ACK/NACK" (Exh. A (082 Patent) at 5:19-20).

Exh. A (082 Patent), Figure 3
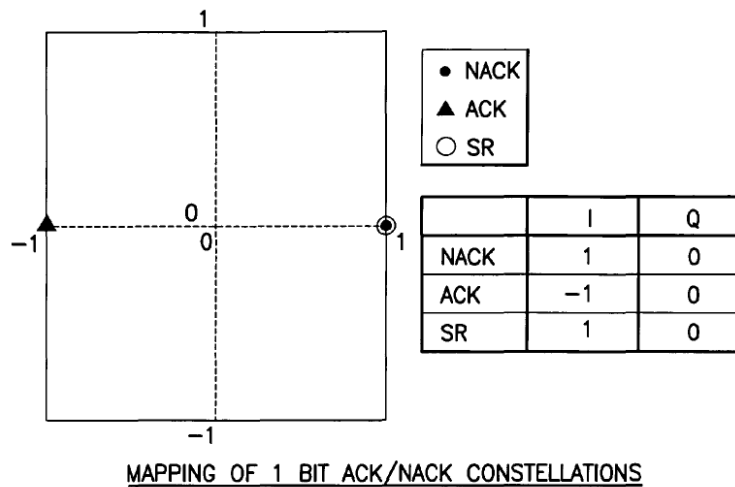

MAPPING OF 1 BIT ACK/NACK CONSTELLATIONS

FIG.3

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is to be included. The "message generation means" is described in the 082 patent as a processor, memory, and/or associated software (*See* Exh. A (082 Patent), Fig. 2 at Block 10F). The only dispute is whether the specification discloses an algorithm corresponding to the recited function.

In this one-bit mapping, several of the claimed scenarios are disclosed. For example, claim 10 recites "generating a message comprising a scheduling request and configuring the message in a first configuration in response to a determination that the acknowledgement is not to be included." The circle in Figure 3 represents SR without ACK/NACK (Exh. A (082 Patent) at 7:54-56). Figure 3 similarly discloses the algorithm for "configuring the message in a second configuration comprising the acknowledgement in response to a determination that the acknowledgement is to be included, where the first configuration is distinct from the second configuration." The triangle in Figure 3 shows the configuration for sending SR and ACK (Exh. A (082 Patent) at 9:54-61). Figure 3 discloses the algorithm for configuring the message in "a third configuration comprising the negative-acknowledgement in response to a determination that the negative-acknowledgement is to be included." The filled in circle shows transmitting SR and NACK (*id*.). Figures 4, 5, 6, and 12 similarly provide alternative constellation mappings.

Therefore, the flowchart in Figure 8 and the constellation mappings shown in Figures 3, 4, 5, 6, and 12, and the corresponding text provide sufficient disclosure of an algorithm for the message generation means. *Chicago Bd. Options Exch., Inc. v. Int'l Sec. Exch., LLC*, 748 F.3d 1134, 1140-42 (Fed. Cir. 2014) ("Such an 'algorithm' may be expressed 'in any understandable terms including as a mathematical formula, in prose, or as a flow chart, or in any other manner that provides sufficient structure' to a person of ordinary skill in the art.").

B.   The specification discloses corresponding structure and an algorithm for the "first determining means" and the "second determining means"

Claim Term	NSN's Proposed Construction	Huawei's Proposed Construction
"first determining means for determining whether an acknowledgement is to be	Governed by 35 U.S.C. § 112 ¶ 6. Function: Agreed to.	Governed by 35 U.S.C. § 112 ¶ 6. Function: Agreed to.

transmitted in a same sub-frame as the message" Claim 10	Structure: first determining means (10E) such as processor, memory, and/or associated software for performing the algorithm shown in Fig. 8 and corresponding text, *e.g.*, 9:52-61, and equivalents thereof	Structure: The specification fails to set forth any algorithm for the function claimed in this software limitation. Claim is indefinite.
"second determining means for determining whether a negative-acknowledgement is to be transmitted in the same sub-frame as the message" Claim 10	Governed by 35 U.S.C. § 112 ¶ 6. Function: Agreed to. Structure: second determining means (10E) such as processor, memory, and/or associated software for performing the algorithm shown in Fig. 8 and corresponding text, *e.g.*, 9:52-61, and equivalents thereof	Governed by 35 U.S.C. § 112 ¶ 6. Function: Agreed to. Structure: The specification fails to set forth any algorithm for the function claimed in this software limitation. Claim is indefinite.

The specification and the claims of the 082 Patent sufficiently discloses structure for the first and second "determining means" recited in claim 10.[2] And the specification sufficiently discloses an algorithm for "determining whether an acknowledgement is to be transmitted in a same sub-frame as the message" and "determining whether a negative-acknowledgement is to be transmitted in the same sub-frame as the message" (Exh. A (082 Patent) at 13:42-47).

As discussed above, Claim 10 separately recites a "message generation means for generating a message comprising a scheduling request [SR]." Therefore, the function of the "first determining means" and "second determining means" is determining whether the ACK or NACK is to be transmitted with SR.

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[2] The parties agree that the function of the "first determining means" is for "determining whether an acknowledgement is to be transmitted in a same sub-frame as the message." The parties also agree that the function for the "second determining means" is for "determining whether a negative-acknowledgement is to be transmitted in the same sub-frame as the message." Huawei does not seem to dispute that the patent specification discloses a processor and memory. *See also* Fig. 2 at block 10E; 13:43-47.

In order to perform this function, the patent specification discloses:

> [W]ith SR=0 (e.g., in the case of a negative SR transmission), the UE 10 transmits the ACK/NACK information using the ACK/NACK resources, with SR=1 (e.g., in the case of positive SR transmission), the UE 10 transmits the ACK/NACK information using the SR resources.

(Exh. A (082 Patent) at 7:39-43).   The passage describes that when SR and ACK need to be transmitted simultaneously, ACK is transmitted using SR resources.   Similarly, when SR and NACK need to be transmitted simultaneously, NACK is transmitted using SR resources.   This algorithm is shown in Figure 8:
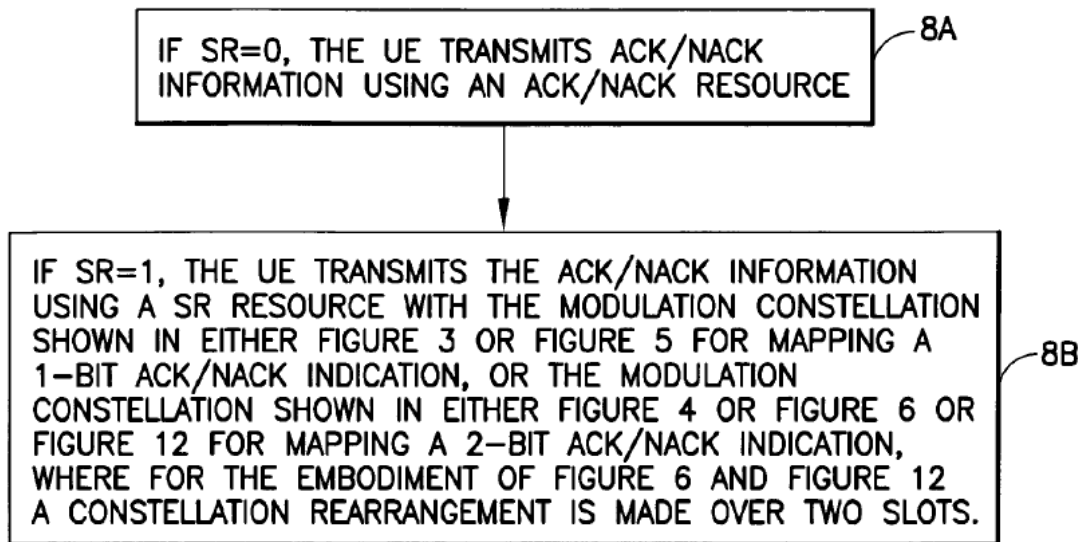
Exh. A (082 Patent), Figure 8

FIG.8

Thus, the specification discloses that the "first determining means" determines whether an ACK is to be transmitted in the same subframe as the message by determining whether there is also a SR to be sent.   Similarly, the specification discloses that the "second determining means"

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determines whether a NACK is to be transmitted in the same subframe as the message by determining whether there is also a SR to be sent.

The patent also describes "determining whether an ACK or NACK is to be transmitted in the same subframe as the message." For example, the patent states that "the acknowledgement indicates that a downlink resource allocation grant has succeeded and that each of at least one corresponding codeword has been detected correctly" (Exh. A (082 Patent) at 12:25-29). Similarly, the patent discloses that "the negative-acknowledgement indicates that a downlink resource allocation grant has succeeded and that each of at least one corresponding codeword has not been detected correctly" (Exh. A (082 Patent) at 12:20-24). A person of ordinary skill in the art would understand how to implement such an algorithm. *Enfish, LLC v. Microsoft Corp.*, 822 F. 3d 1327, 1340 (Fed. Cir. 2016) ("The fact that this algorithm relies, in part, on techniques known to a person of skill in the art does not render the composite algorithm insufficient under § 112 ¶ 6. Indeed, this is entirely consistent with the fact that the sufficiency of the structure is viewed through the lens of a person of skill in the art and without need to 'disclose structures well known in the art.'"). Therefore, the specification sufficiently discloses an algorithm for the "first determining means" and the "second determining means."

C.   The term, "configuration," read in the context of the specification, means "constellation point" under its plain and ordinary meaning

Claim Term	NSN's Proposed Construction	Huawei's Proposed Construction
"configuration" passim	Plain and ordinary meaning, such as "constellation point"	Plain meaning

NSN's construction clarifies to the jury that "configuration" means "constellation point" in the context of the 082 Patent. The invention of the 082 Patent is directed to the configurations

for sending SR and ACK/NACK simultaneously. The term "configuration" refers to the particular constellation point for which a message is configured.

The claims themselves indicate that the term "configuration" means constellation point. Claims 7 and 8 specify that each "configuration" is "represented using" a single symbol or multiple modulation symbols (*see also* Exh. A (082 Patent) at 11:15-20). Therefore, "configuration" must be construed as something that may be represented using modulation symbols. The specification explains that "[c]onstellation points may be represented using one or more modulation symbols, *e.g.*, one or more digital bits" (*id.* at 7:22-26). Thus, construing "configuration" as "constellation point" harmonizes the independent claims with dependent claims 7 and 8 and the specification.

Moreover, the specification discusses that the messages to be sent are configured based on a constellation point (*see* Figures 3–6 and 12). The embodiments shown in Figures 3, 4, 5, 6, and 12 all provide ways that improve DTX detection through the use of constellation points (Exh. A (082 Patent) at 7:22-8:16, *see also* 8:57-59 ("the modulation constellations shown in Figs. 3, 4, 5 and 6 may be used to improve the DTX detection")). For example, the specification states:

> In a first approach the SR plus DTX is transmitted by using the same constellation point as a NACK, with the goal being to maximize the separation between the ACK and SR signals…. In this manner the constellation arrangements for SR only, for SR plus DTX and for SR plus NACK are the same. Thus, the constellation points for ACK/NACK are such that the DTX-to-ACK problem is minimized since a DTX detection failure of an SR plus DTX would most likely read an SR plus NACK.

(*Id.* at 7:22-35). NSN's proposed construction is consistent with how a person of ordinary skill would understand the term in the context of the patent specification.

The term should be construed such that the jury can understand the claim in the context of the 082 invention. NSN's construction provides the clarification that the jury needs and that is consistent with the claims and the specification. Thus, the Court should adopt NSN's construction of "configuration" as "constellation point."

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D.   The claim phrase, "a downlink allocation grant has succeeded," refers to situations in which a UE would send an ACK or NACK

Claim Term	NSN's Proposed Construction	Huawei's Proposed Construction
"a downlink resource allocation grant has succeeded" Claims 1, 2, 11, 15, 16, 18	Plain and ordinary meaning	"a message granting a downlink resource allocation was successfully received"

The claim language "a downlink resource allocation grant has succeeded" has a plain and ordinary meaning. No further construction is necessary. The 082 Patent teaches that this term encompasses the situation where upon receiving a downlink codeword, the UE would send an ACK *or* NACK.   Huawei's construction excludes the NACK situation and thus excludes a preferred embodiment of the patent itself.

As discussed above, the 082 Patent seeks to define constellation arrangements for SR, SR with ACK, and SR with NACK, such that DTX will not be mistaken for an ACK. ACK *or* a NACK are sent when the "downlink resource allocation grant has succeeded" (Exh. A (082 Patent) at 4:16-19, 12:20-30). The specification states:

> [T]he negative-acknowledgement indicates that a downlink resource allocation grant has succeeded and that each of at least one corresponding codeword has not been detected correctly.   [T]he acknowledgement indicates that a downlink resource allocation grant has succeeded and that each of at least one corresponding codeword has been detected correctly.

(*Id*. at 12:20-30). Therefore, a person of ordinary skill in the art would understand that the term the "downlink resource allocation grant has succeeded" describes any situation in which the UE would send an ACK or NACK. ACK is sent when the downlink resource allocation grant has succeeded, and the corresponding codewords have been detected correctly. NACK is sent when the downlink resource allocation grant has succeeded, and the corresponding codewords have ***not***

been detected correctly. An example of this process is explained in Plaintiffs' Technology Tutorial (*see* Plaintiffs' Technology Tutorial at slides 14-15).

Huawei's proposed construction is wrong to exclude NACKs. Because, in a NACK, the codewords were not detected correctly, the downlink resource allocation succeeds, but the *reception* of the downlink resource allocation was not entirely successful. Because Huawei's construction suggests that the reception must be successful, which suggests exclusion of the preferred NACK embodiment, it must be rejected. *Smith & Nephew, Inc. v. Ethicon, Inc.*, 276 F.3d 1304, 1309–10 (Fed. Cir. 2001) ("A claim interpretation that would exclude the reasonable practice of the method taught in the patent 'is rarely the correct; interpretation; such interpretation requires highly persuasive evidentiary support").

E.   The "determining whether a third indication is to be transmitted" step is definite

Claim Term	NSN's Proposed Construction	Huawei's Proposed Construction
"determining whether a third indication is to be transmitted in a sub-frame with an indication of a scheduling request, where the third indication indicates that a downlink resource allocation grant has succeeded and that each of the at least one corresponding codeword has not been detected correctly" Claim 1	Plain and ordinary meaning	Indefinite

A person of ordinary skill would understand this claim phrase, even though "a downlink resource allocation grant" and "a subframe" were recited earlier in the claim. Huawei argues that, because the claim recites a downlink resource allocation grant twice, a person of ordinary skill in the art cannot ascertain with reasonable certainty to which downlink resource allocation grant the recited codeword(s) corresponds (Exh. C (Huawei Invalidity Contentions) at 117-118). Similarly,

Huawei argues that the claim is indefinite for reciting multiple "sub-frames" (*id*.). The fact that the claim uses the indefinite article "a" twice when introducing these terms, in different contexts, does not make the claim indefinite.   These terms are used in different, clearly distinct circumstances, as seen for example by viewing the claim in light of the preferred embodiments. In one circumstance, where a downlink resource allocation grant has succeeded and the codewords have been detected correctly, an ACK should be sent. In the other circumstance, where a downlink resource allocation grant has succeeded and the codewords have ***not*** been detected correctly, a NACK should be sent. There is nothing wrong with the patentee introducing "a downlink resource allocation" and "a subframe" in the portions of the claim corresponding to each circumstance.

It is understood that the UE will send an ACK or NACK in a subframe in response to each downlink resource allocation grant (along with its corresponding codeword(s)). Consistent with the disclosed embodiments, the second indication may be mapped to an ACK and the third indication may be mapped to a NACK (*see also* Exh. A (082 Patent) at 13:50-62; Abstract). Therefore, a person of ordinary skill in the art would understand that "determining whether a third indication [*e.g.*, a NACK] is to be transmitted" is in response to the same downlink resource allocation grant for which it was "determin[ed] whether a second indication [*e.g.*, an ACK] is to be transmitted."   In this example, the NACK is then transmitted in the subframe reserved for ACK/NACK. A person of ordinary skill would understand that an ACK or NACK is sent in a subframe in response to a downlink allocation grant and corresponding codewords. Claim 1 makes this clear, "sending the message, via a Wireless transmitter, in the sub-frame" (*id*. at 16:7-8).

The specification states that the "acknowledgment indicates that a downlink resource allocation grant has succeeded and that each of at least one corresponding codeword has been detected correctly," while a "negative-acknowledgement indicates that a downlink resource

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allocation grant has succeeded and that each of at least one corresponding codeword has not been

detected properly" (Exh. A (082 Patent) at 12:20-30). It is readily apparent that an ACK or NACK

is sent in response to a downlink resource allocation grant in the subframe reserved for

ACK/NACK. Therefore, a person of ordinary skill in the art would understand the claim with

reasonable certainty.

II.   DISPUTED TERMS AND PROPOSED CONSTRUCTIONS OF THE 035 PATENT

A.   The specification discloses corresponding structure and an algorithm for the "means for determining"

Claim Term	NSN's Proposed Construction	Huawei's Proposed Construction
"means for determining that at least one downlink allocation grant for the apparatus of the scheduling information was not received" Claim 1	Governed by 35 U.S.C. § 112 ¶ 6. Function: Agreed to. Structure: processor, memory, and/or associated software for performing the algorithm shown in Figs. 3 (specifically 3C) and 6 (specifically 6B and 6C) and discussed in the specification, *e.g.*, 9:53-10:21, and equivalents thereof	Governed by 35 U.S.C. § 112 ¶ 6. Function: Agreed to. Structure: The specification fails to set forth any algorithm for the function claimed in this software limitation. Claim is indefinite.

The specification adequately describes an algorithm for "determining that at least one

downlink allocation grant for the apparatus of the scheduling information was not received."[3]

Several figures and the accompanying text describe the algorithm for the "means for determining."

Figure 3 discloses a three step algorithm for "determining that at least one downlink

allocation grant for the apparatus of the scheduling information was not received."

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[3] The parties agree that the function of the "means for determining" is for "determining that at least one downlink allocation grant for the apparatus of the scheduling information was not received."

Exh. B (035 Patent), Figure 3
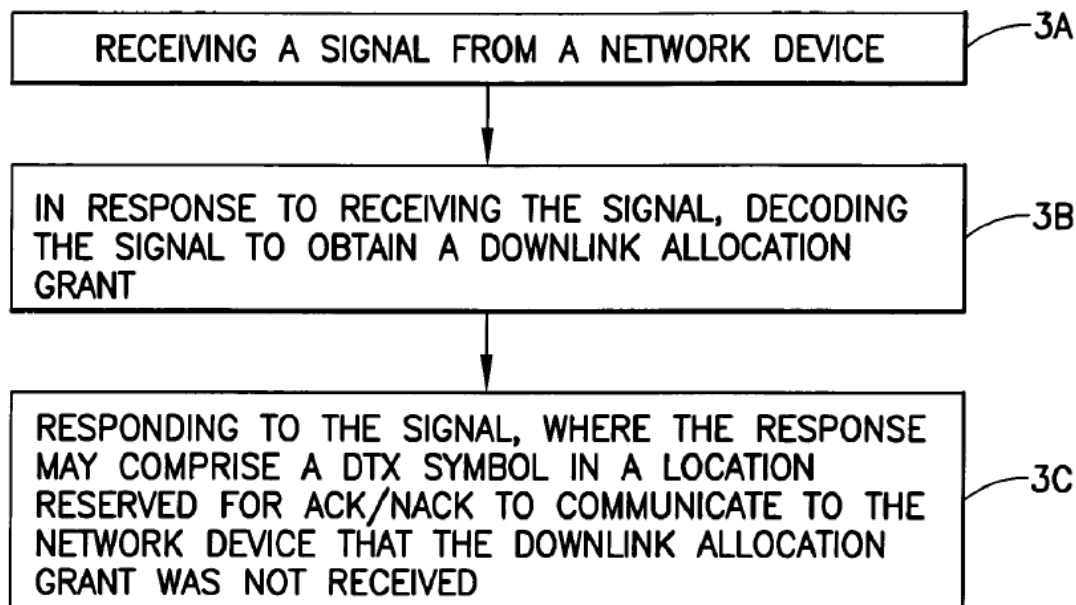
FIG.3

In describing Figure 3, the patent specification discloses a computer program that comprises:

> receiving a signal from a network device (3A), in response to receiving the signal, decoding the signal to obtain a downlink allocation grant (3B), and responding to the signal where the response may comprise a DTX symbol in a location reserved for ACK/NACK to communicate to the network device that the downlink allocation grant was not received (3C).

(Exh. B (035 Patent) at 8:49-60).

The specification states that one way to determine whether a downlink allocation grant

was not received is to use a downlink assignment index. The 035 Patent states:

> [T]he UE may only encode the 2-states (ACK or NACK) feedback from the scheduled DL subframes. This is achieved by comparing the downlink assignment index (DAI) in the UL grant to the DAI (as a pure counter) in DL grant, by which the UE can identify any missed DL assignment and its position among all transmitted DL assignments.

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(Exh. B (035 Patent) at 10:6-13). A person of ordinary skill in the art would understand how to

execute such an algorithm based on this disclosure. Therefore, the 035 Patent specification

sufficiently discloses an algorithm for the "means for determining."

B.   The specification discloses an algorithm for the "means for sending a reply"

Claim Term	NSN's Proposed Construction	Huawei's Proposed Construction
"means for sending a reply to the received scheduling information that comprises an indication of discontinuous transmission in response to the determining" Claim 23	Governed by 35 U.S.C. § 112 ¶ 6. Function: Agreed to. Structure: a transmitter, transceiver, processor, memory, and/or associated software for performing the algorithm shown in Figs. 3 (specifically 3C) and 6 (specifically 6D), and discussed in the specification, *e.g.*, 6:57-7:57, 9:43-10:55, and equivalents thereof	Governed by 35 U.S.C. § 112 ¶ 6. Function: Agreed to. Structure: The specification fails to set forth any algorithm for the function claimed in this software limitation. Claim is indefinite.

The patent specification adequately describes an algorithm for "sending a reply to the

received scheduling information that comprises an indication of discontinuous transmission in

response to the determining."[4] The algorithm is disclosed in Figure 3 (specifically 3C), Figure 6

(specifically 6D), and discussed in the specification (Exh. B (035 Patent) at 6:57-7:57, 9:43-10:55).

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[4] The parties agree that the function of the "means for sending" is for "sending a reply to the received scheduling information that comprises an indication of discontinuous transmission in response to the determining."

Figure 3 depicts a flow chart illustrating one non-limiting example the claimed algorithm.

Exh. B (035 Patent), Figure 3


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RECEIVING A SIGNAL FROM A NETWORK DEVICE          —3A

IN RESPONSE TO RECEIVING THE SIGNAL, DECODING     —3B
THE SIGNAL TO OBTAIN A DOWNLINK ALLOCATION
GRANT

RESPONDING TO THE SIGNAL, WHERE THE RESPONSE
MAY COMPRISE A DTX SYMBOL IN A LOCATION           —3C
RESERVED FOR ACK/NACK TO COMMUNICATE TO THE
NETWORK DEVICE THAT THE DOWNLINK ALLOCATION
GRANT WAS NOT RECEIVED
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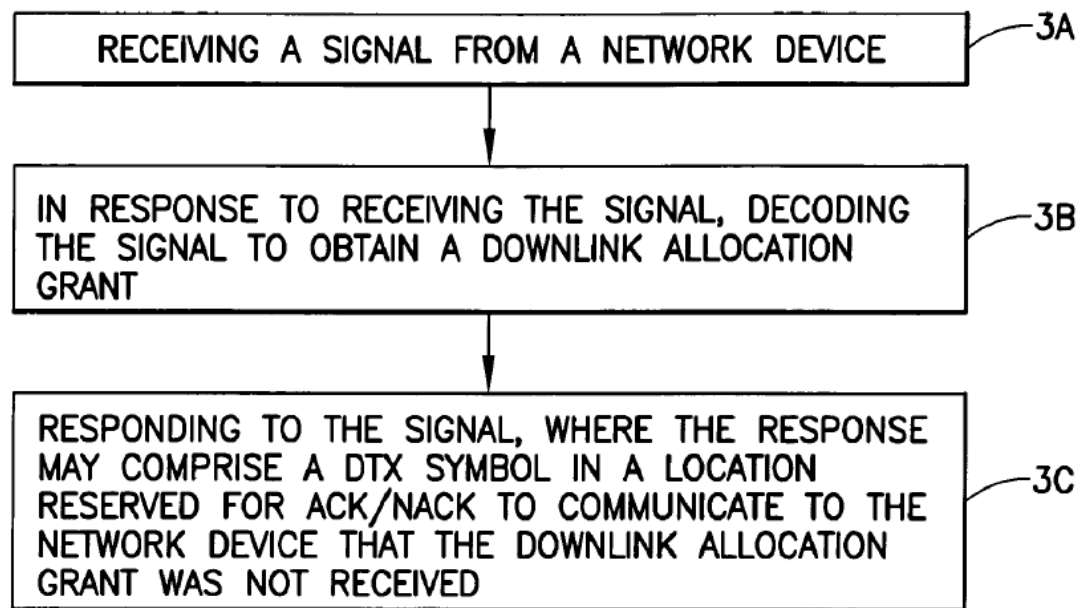
FIG.3

In Figure 3, step 3C discloses "responding to the signal, where the response may comprise a DTX symbol in a location reserved for ACK/NACK to communicate the network device that the downlink allocation grant was not received." Further, the specification at 6:57-7:57 provides algorithms for how to implement the DTX symbol in a location reserved for an ACK/NACK (Exh. B (035 Patent) at 6:57-7:57, Fig. 2). For example, this portion of the specification discloses, "when the DTX is transmitted, every other symbol would use the constellation points reserved for ACK, while the rest of the symbols would use constellation points reserved for NACK," which can be referred to as a "Hadamard-spreading code selection" (*id*. at 6:65-7:1). The specification further gives an example of the implementation of the Hadamard-spreading code selection (*id*. at 7:9-15).

As an additional example, the specification states:

> FIG. 2 illustrates an exemplary structure for transmitting an explicit DTX with the
> 1 or 2 bit ACK/NACK structure. In every other (e.g. odd) symbol the constellation
> point at the upper right corner of FIG. 2 (designated as 2A) is transmitted. In the
> rest of the symbols (even) the point at the lower left corner of FIG. 2 (designated
> 2B) is transmitted.

(Exh. B (035 Patent) at 7:34-39).

The patent specification also discloses an embodiment where the UE transmits a single

DTX bit. Block 6C shows that "the UE transmits a discontinuous transmission DTX indication

with the UE's reply to the scheduling information."
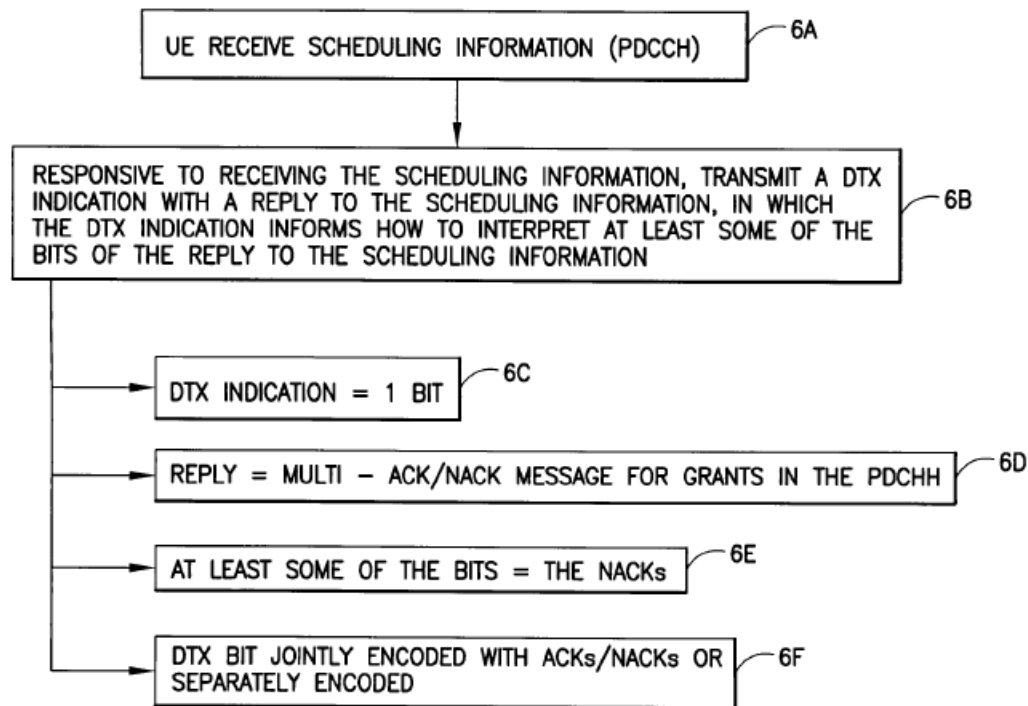

Exh. B (035 Patent), Figure 6

FIG.6

The specification continues on to describe additional details of this algorithm (Exh. B (035

Patent) at 9:43-10:55). Thus, the specification of the 035 Patent sufficiently discloses an algorithm

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for "sending a reply to the received scheduling information that comprises an indication of discontinuous transmission in response to the determining."

C.   The term "scheduling information" does not necessarily have to be a "single signal"

Claim Term	NSN's Proposed Construction	Huawei's Proposed Construction
"scheduling information" passim	Plain and ordinary meaning	"a single signal containing one or more downlink allocation grants"

The commonly understood words "scheduling information" do not need Court construction because their ordinary meaning is readily apparent. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (2005); *SmartPhone Techs. LLC v. Research in Motion Corp.*, Nos. 6:10-cv-74, 6:10-cv-580, 2012 WL 3150756, at *23 (E.D. Tex. Aug. 2, 2012).   Huawei's construction seeks to limit "scheduling information" to a "single" signal. This improperly imports a limitation into the claim and would further confuse the jury. *SmartPhone Techs. LLC*, 2012 WL 3150756, at *13. Since this term would have been understood to a person of ordinary skill in the context of the 035 Patent, it should be given its plain and ordinary meaning. *Power-One, Inc. v. Artesyn Techs., Inc.*, 599 F.3d 1343, 1348 (Fed. Cir. 2010); *Morpho Komodo LLC v. Blu Prods. Inc.*, No. 2:15-cv-1100-JRG-RSP, 2016 WL 3976491, at *16 (E.D. Tex. July 25, 2016); *Ericsson Inc. v. TCL Comm'n Tech. Holdings, Ltd.*, 161 F. Supp. 3d 438, 444 (E.D. Tex. 2015).

Nothing in the specification of the 035 Patent requires that the scheduling information be a "single signal." Huawei cites to Figs. 3 and 6 and certain portions of the specification as purportedly supporting its position. The portions of the specification to which Huawei points describe "a signal," and never use the term "single." *See* Fig. 3 at 3A. The indefinite article "a" does not have the same meaning as "single." *KCJ Corp. v. Kinetic Concepts, Inc.*, 223 F.3d 1351,

1356 (Fed. Cir. 2000) ("This court has repeatedly emphasized that an indefinite article "a" or "an" in patent parlance carries the meaning of "one or more" in open-ended claims").

Even with the disclosure of an embodiment with a "single" signal, it is improper to read limitations from a preferred embodiment into the claims, even if it is the only embodiment disclosed in the specification (which it is not, in this case). *Ericsson Inc.*, 161 F. Supp. 3d at 444 (citing *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 913 (Fed. Cir. 2004)); *GE Lighting Solutions, LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014). Thus, the specification places no limitations on the number of signals that comprise the "scheduling information," and there is no basis for limiting the plain and ordinary meaning to "a single signal." *See Ericsson Inc.*, 161 F. Supp. 3d at 451; *GE Lighting Sol'ns, LLC*, 750 F.3d at 1311 ("where the claims can reasonably [be] interpreted to include a specific embodiment, it is incorrect to construe the claims to exclude that embodiment, absent probative evidence on the contrary").

Huawei's proposal fails the requirement that a term should be given the full scope of its plain and ordinary meaning with only two exceptions: (1) a patentee sets out a definition and acts as his own lexicographer, or (2) the patentee disavows the full scope of a claim term either in the specification or during prosecution. *GE Lighting Sol'ns, LLC*, 750 F.3d at 1308-09 (Fed. Cir. 2014) (citing *Thorner v. Sony Computer Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012)). Neither of these conditions has occurred with the "clarity, deliberateness" or "unmistakable surrender" that the standard requires. *Ericsson Inc.*, 161 F. Supp. 3d at 445-46.

D. "An indication of discontinuous transmission"

Claim Term	NSN's Proposed Construction	Huawei's Proposed Construction
"an indication of discontinuous transmission" Claims 1, 12, 22, 23	"an explicit or implicit indication of discontinuous transmission"	"an explicit or implicit indication of discontinuous transmission"

The parties are in agreement that "an indication of discontinuous transmission" should be construed as "an explicit or implicit indication of discontinuous transmission."

E. The terms, "persistent allocation" and "semi-persistent allocation," are understood by a person of ordinary skill in the art

Claim Term	NSN's Proposed Construction	Huawei's Proposed Construction
"persistent allocation" and "semi-persistent allocation" Claims 5, 15	Plain and ordinary meaning	Indefinite

The terms "persistent allocation" and "semi-persistent" allocation have definite meanings and can be understood by a person of ordinary skill in the art with reasonable certainty. *See Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014). The term "persistent allocation" is described in the specification. For example, the specification states:

> VoIP is an example of an application which can use persistent allocation. In persistent allocation the UL resources are allocated persistently to the UE and thereby UL allocation grants are not sent.

(Exh. B (035 Patent) at 5:28-31). As such, persistent allocation refers to resources that are allocated continuously and therefore do not need to be allocated using uplink allocation grants. Because the term "persistent allocation" is explained in the specification, it is not indefinite. *Energizer Holdings, Inc. v. Int'l Trade Comm'n*, 435 F.3d 1366, 1370 (Fed. Cir. 2006) ("Claim definiteness is analyzed 'not in a vacuum, but always in light of the teachings of the prior art and

of the particular application disclosure as it would be interpreted by one possessing the ordinary

level of skill in the pertinent art.'""). Similarly, the term "semi-persistent allocation" would be well

understood from the description of the term "persistent allocation."   In a "semi-persistent"

allocation, the allocation is not always persistent, but is only partially so. This understanding

follows directly from the ordinary meaning of the prefix "semi-."[5]

Moreover, Huawei admits that the terms are well known by a person of ordinary skill in

the art. Huawei's invalidity contentions argue that the examiner took official notice that a prior

art reference discloses that "an allocation may be persistent or semi persistent at least to the same

level as disclosed in applicant's specification" (Exh. C (Huawei Invalidity Contentions) at 65-66).

The examiner stated:

> Hakkinen [(U.S. Patent Application Publication No. 2004/0202147)] does not
> disclose wherein the at least one downlink allocation comprises a persistent
> allocation or a semi-persistent allocation, but does disclose that the scheme of
> Hakkinen is implemented or intended to be implemented at least for HSDPA, a key
> feature of the 3GPP specifications for UTRAN. ***The examiner takes official notice***
> ***that downlink resource allocations for HSDPA can be semi-static*** and therefore
> an allocation may be persistent or semi-persistent at least to the same level as
> disclosed in applicant's specification.

(Exh. D (035 Patent File History) at NSNH00016290). The fact that these terms are used by

members of 3GPP is additional intrinsic evidence that a person of skill in the art would understand

these terms. For example, both terms were used in submissions to 3GPP and in Section 36.213 of

the 3GPP standard (Exh. D (035 Patent File History) at NSNH00015848 (referring to "persistent

allocation" and "semi-persistent PUSCH transmission"), NSNH00015893-94 (referring to "semi-

persistently scheduled PDSCH transmission")). Members of 3GPP use these terms because

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[5] Even though the term "semi-persistent allocation" is not explicitly defined in the specification,
it does not mean that the term is indefinite. *Bancorp Servs., LLC v. Hartford Life Ins. Co.*, 359
F.3d 1367, 1373 (Fed. Cir. 2004) ("The failure to define the term is, of course, not fatal, for if the
meaning of the term is fairly inferable from the patent, an express definition is not necessary").

"persistent allocation" and "semi-persistent allocation" have a well understood meaning to those

skilled in the art.

In its invalidity contentions, Huawei also argues that the terms are indefinite because "it is

unclear that what degree of persistency of an allocation is covered by these claims" (Exh. C

(Huawei Invalidity Contentions) at 122). Numerical precision in the claims, however, is not

required if the language is as precise as the subject matter permits. *PPG Indus., Inc. v. Guardian*

Indus. Corp., 75 F.3d 1558, 1562–63 (Fed. Cir. 1996); *see also Interval Licensing LLC v. AOL,*

Inc., 766 F.3d 1364, 1370 (Fed. Cir. 2014) ("Claim language employing terms of degree has long

been found definite where it provided enough certainty to one of skill in the art when read in the

context of the invention"). The patent specification does not need to define the "degree of

persistency of an allocation" in order to be definite. Therefore, the terms "persistent allocation"

and "semi-persistent allocation" are definite.

F.   **The claim phrase, "a downlink assignment index that indicates a
number of downlink allocations grant for the [communication
node/apparatus] in the scheduling information" is not indefinite**

Claim Term	NSN's Proposed Construction	Huawei's Proposed Construction
"a downlink assignment index that indicates a number of downlink allocations grant for the [communication node/apparatus] in the scheduling information" Claims 9, 19	"a downlink assignment index that indicates a number of downlink allocations granted for the [communication node/apparatus] in the scheduling information"	Indefinite

The typographical error ("grant" is supposed to recite "granted") in claims 9 and 19 is

easily recognizable and resolvable by a person of ordinary skill in the art. Huawei argues that

claims 9 and 19 are indefinite based on this obvious small typographical error. A person of

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ordinary skill in the art would readily understand the claim as written and would readily understand how to correct the typographical error. There is no reasonable expert that could testify that the claim is confusing and that a person of ordinary skill could not resolve the typographical error.

In its cases against T-Mobile and NSN, Huawei itself corrected several typographical errors in its patents. *Huawei Tech. Co. LTD., v. T-Mobile US, Inc.*, 2:16-cv-00052-JRG-RSP, Dkt. 110 at 1-2 (E.D. Tex. Dec. 9, 2016) (Huawei and NSN agreeing that the claim term "b" should be construed as "by" and that the term "S-CSCF currently providing a service for the user fails" should be construed as "S-CSCF currently assigned to provide a service for the user has failed"); *Huawei Tech. Co. LTD. v. T-Mobile US, Inc.*, 2:16-cv-00055-JRG-RSP, Dkt. 108 at 1-2 (E.D. Tex. Dec. 7, 2016) (Huawei and NSN agreeing that the claim term "the credit information" should be construed as "credit information" and the term "the collected charging data information of the UE" should be construed as "collected charging data information of the UE.").

A claim term, "read in light of the specification delineating the patent, and the prosecution history," need only to inform, "with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus*, 134 S. Ct. at 2124. The specification of the 035 Patent states that "the reply can comprise a downlink assignment index that indicates a number of downlink allocations in the scheduling information" (Exh. B (035 Patent) at 14:29-32). Reading this disclosure in the specification, a person of ordinary skill would readily understand the phrase to mean "a downlink assignment index that indicates a number of downlink allocations granted for the [communication node/apparatus] in the scheduling information." There is no other plausible construction and Huawei has not suggested one. Therefore, the phrase is not indefinite as written. *Novo Indus., L.P. v. Micro Molds Corp.*, 350 F.3d 1348, 1357 (Fed. Cir. 2003) (stating that courts have the authority to correct "obvious minor typographical and clerical errors in patents").

CONCLUSION

For the foregoing reasons, NSN respectfully requests that the Court adopt its proposed

constructions for each of the claim terms in dispute and hold that none of the claim terms are

indefinite.

Dated: March 17, 2017

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CERTIFICATE OF SERVICE

I hereby certify that on March 17, 2017, I caused the foregoing document to be electronically filed with the Clerk of the Court using CM/ECF, which will send notification of such filing to all registered participants.

/s/ John D. Haynes
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